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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/960,366	09/24/2001	Makoto Miyamoto	500.35843CC2	8432

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EXAMINER

ANGEBRANDT, MARTIN J

ART UNIT	PAPER NUMBER
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1756

DATE MAILED: 05/22/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/960,366

Applicant(s)

MIYAMOTO ET AL.

Examiner

Martin J Angebrannt

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 September 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 32-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 32-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 08/978,043.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1.5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 32-40 and 42-43 are rejected under 35 U.S.C. 102(b) as being fully anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over JP 05-342631.

JP 05-342631 teaches with respect to figure 1, a substrate, a 150 tantalum oxide layer (2), a 30 nm zinc sulfide/silicon dioxide layer (3), a phase change GeSbTe recording layer (4), a second 30 nm zinc sulfide/silicon dioxide layer (5), a second 150 tantalum oxide layer (6), a third 30 nm zinc sulfide/silicon dioxide layer (7), an Al reflective layer (8), an adhesive layer (9) and a support (10). [0009]. In the example in section [0014], the interlayers are 1-5 nm thick and include zinc sulfide/silicon dioxide.

With the exception of claims reciting the thickness of the innermost protective layers (third and fourth), the claims are anticipated. With respect to these claims, it is not clear what the thickness actually used in the embodiment of section [0014] was, although it clearly was

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between 1 and 5 nm. The examiner holds that a thickness of 2-5 nm was used in preparation of the medium corresponding to this section, thereby anticipating the claims, or alternatively, it would have been obvious to do so based upon the teachings within the reference at section [0014]. The examiner has interpreted the "made of" language of claims 33,36,42 and 43 as equivalent to "comprising" type open language.

4. Claim 32-38 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Kawahara et al. '669.

Kawahara et al. '669 teaches with respect to figure 1, a substrate, a 70 nm zinc sulfide/silicon dioxide layer (2), a 40 nm silicon dioxide layer (3), a 5 nm zinc sulfide/silicon dioxide (4) a phase change GeSbTe recording layer (5), a second 5 nm zinc sulfide/silicon dioxide layer (6), a second 40 nm silicon dioxide layer (7), a third 170 nm zinc sulfide/silicon dioxide layer (8), an Al reflective layer (9), an adhesive layer (10) and a support (11).

The examiner holds that the 5 nm zinc sulfide/silicon dioxide layers correspond to the third and fourth protective layers and the 40 nm silicon dioxide layers correspond to the first and second protective layers.

5. Claim 32-34,36,37,39,40, and 42-43 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Furukawa et al. EP 0376700.

Furukawa et al. EP 0376700 teaches with respect to figure 1, a substrate, a 150 nm zinc sulfide/silicon dioxide layer (3), a 10-20 nm silicon dioxide layer (4), a phase change GeSbTe recording layer (5), a second 10-20 nm silicon dioxide layer (6), a third 150 nm zinc sulfide/silicon dioxide layer (7), a Ni-Cr reflective layer (9), an adhesive layer (11) and a support (10). (3/1-37) The use of other materials, such as oxides, nitrides and carbides for the reaction

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prevention layers, 4 and 6 is disclosed. (4/23-32) . Other useful dielectric layer materials are disclosed (4/35-40).

6. Claims 32-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 05-342631, in view of Yoshioka et al. '752.

Yoshioka et al. '752 teaches that a 20 nm gold layer may be used to protect an underlying reflective layer mainly consisting of Aluminum (100 nm) used in a phase change recording medium. (3/1-39) The use of aluminum or Al alloys with corrosion resistant additives is disclosed. (1/48-58) The use of three reflective golds layers having thicknesses of 10-30 nm for the outside layers and 60-130 nm for the middle layer is also disclosed with respect to the second embodiment (3/54-4/13 and 3/15). The lower dielectric may be 150 nm and the upper 20 nm. (3/26-40).

It would have been obvious to one skilled in the art to modify the invention of JP 05-342631 by adding a gold layer to prevent corrosion of the Al reflective layer as taught by Yoshioka et al. '752.

7. Claims 32-38 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawahara et al. '669, in view of Yoshioka et al. '752.

It would have been obvious to one skilled in the art to modify the invention of Kawahara et al. '669 by adding a gold layer to prevent corrosion of the Al reflective layer as taught by Yoshioka et al. '752.

8. Claims 32-34,36,37 and 39-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al. EP 0376700, in view of Hirotsune et al. '649.

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Hirotsune et al. '649 teaches optical recording media which comprise a substrate, a lower protective layer, a GeSbTe recording layer, an upper protective layer, a first reflective layer and a second reflective layer. Useful compositions for the recording layer are disclosed in columns 9 and 10. Useful protective layer compositions and the use of multilayers thereof are disclosed. (12/50-67) Grooved substrates are disclosed. (13/1-13) The use of materials and thicknesses which result in a first reflective layer which has an attenuation factor of less than 4 is disclosed, including the use of materials such as Mo, Ni, Fe, Cr, Ti, W, Ta, Co, Sb, Mg and V. (16/7-24) The thickness of the first layer may be less than 30 nm, preferably less than 15 nm (16/41-45). The second reflective layer may contain Al, Cu, Au and alloys thereof with additives Mo, Pd and Pt (13/32-14/2 and 16/46-17/17). The thickness of the second reflective layer should be between 30 and 200 nm. (13/65-14/2) For claim 31 see figures and embodiment 12, which uses a polycarbonate substrate, coated with a 125 nm ZnS-SiO<sub>2</sub> film, a 125 nm CrGeSbTe recording film, a 20 nm ZnS-SiO<sub>2</sub> film, a first reflective layer of Mo having a thickness of 15 nm and a second reflective layer of 10 nm of Al. See also text throughout the twelfth embodiment including the replacement of Mo with other metals and the replacement of Al with various alloys.

It would have been obvious to one skilled in the art to modify the invention of Kawahara et al. '669 by adding a second reflective layer to increase the reflectivity as taught by Hirotsune et al. '649.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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Yamada et al. '063 teach Ge-O and Ge-N-O as a barrier layer between the recording and protective layers.


Miyamoto et al. '555 and '932 claim optical recording media which have plural reflective layers.

Yasuoka et al. '231 (figure 2 and col 2/lines52-61) teaches double and triple protective layers. The use of reflective layers is also disclosed.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin J Angebranndt whose telephone number is 703-308-4397. The examiner can normally be reached on Available Mondays-Thursday and alternative Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on 703-308-2464. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Martin J Angebranndt  
Primary Examiner  
Art Unit 1756

May 19, 2003